WHAT IS CLAIMED IS:

1.   An apparatus for concentration of a material in a process fluid, comprising

        an antenna configured to contact the process fluid;

        a pulse generator coupled to configure the antenna to generate a microwave transmit pulse through the antenna;

        a pulse receiver coupled to the antenna configured to receive a reflected pulse from the antenna; and

        a concentration calculator configured to calculate the concentration of the material as a function of the reflected pulse.

2.   The apparatus of claim 1 wherein the concentration of the material is calculated as a function of a time delay of the return pulse.

3.   The apparatus of claim 1 wherein the concentration of the material is calculated as a function of an energy level of the return pulse.

4.   The apparatus of claim 1 wherein the antenna comprises a pitot tube.

5.   The apparatus of claim 1 wherein the antenna extends in a direction of a flow of the process fluid.

6.   The apparatus of claim 1 wherein the antenna is curved.

7.   The apparatus of claim 6 wherein the antenna is helical.

8.   The apparatus of claim 1 wherein the calculated concentration is transmitted on a process control loop.

9.   The apparatus of claim 4 wherein pulses are carried along an exterior of the pitot tube.

10.   The apparatus of claim 4 wherein pulses are carried along an interior of the pitot tube.

11.   A method of determining the concentration of a material in a process fluid, comprising:
          transmitting a microwave pulse along an antenna which contacts the process fluid;
          receiving a reflected microwave pulse from the antenna in response to the transmitter pulse; and
          calculating concentration of the material in the process fluid as a function of the reflected pulse.

12.   The method apparatus of claim 11 wherein the concentration of the material is calculated as a function of a time delay of the return pulse.

13.   The method of claim 11 wherein the concentration of the material is calculated as a function of an amplitude of the return pulse.

14.   The method of claim 11 wherein the antenna comprises a pitot tube.

15.   The method of claim 11 wherein the antenna extends in a direction of a flow of the process fluid.

16.   The method of claim 11 wherein the antenna is curved.

17.   The method of claim 16 wherein the antenna is helical.

18.   The method of claim 11 wherein the calculated concentration is transmitted on a process control loop.

19.   The method of claim 14 wherein pulses are carried along an exterior of the pitot tube.

20.   The method of claim 14 wherein pulses are carried along an interior of the pitot tube.

21.   The method of claim 14 including calculating a dielectric constant of the process fluid.